IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION

Appl. No.	:	10/749,416	Confirmation No. 9565
Applicant	:	Kendall S. Wills et al.	
Filed	:	December 31, 2003	
TC/A.U.	:	2863	
Examiner	:	Bui, Bryan	
Docket No.	:	TI-37082	
Customer No.	:	23494	

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING OR TRANSMISSION

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9-2-2005
Jackie McBride
Jackie McBride

DECLARATION UNDER 37 C.F.R. 1.131

Sir:

KENDALL S. WILLS, KARTIK RANAMUJACHAR and MICHAEL D. DOCKINS declare as follows:

1. THAT they are the applicants in the subject application for Letters Patent;

2. THAT they conceived the invention as set forth in the attached invention disclosure, the attached paper entitled Wavelet Analysis of One or More Time Domain Reflectometry (TDR) Signals to Determine One or More Characteristics of One or More Anomalies in a Wire and in the subject application for Letters Patent in the United States prior to May 12, 2003 and continually worked on the subject

invention up to their reduction to practice as well as up to the filing of the provisional application Serial No. 60/486,663, filed July 11, 2003, all in the United States;

3. THAT they reduced the invention to practice as disclosed in the subject application in the United States prior to May 12, 2003;

4. THAT all redacted dates on the attached page(s) of the laboratory notebook are prior to May 12, 2003.

I declare under penalty of perjury that the above stated facts are true and correct on information and belief.

Kendall S. Wills — Date: 9/1/2005

Kartik Ramanujachar — Date: 9/1/2005

Michael D. Dockins — Date:

Respectfully submitted,

Texas Instruments Incorporated

Yingsheng Tung

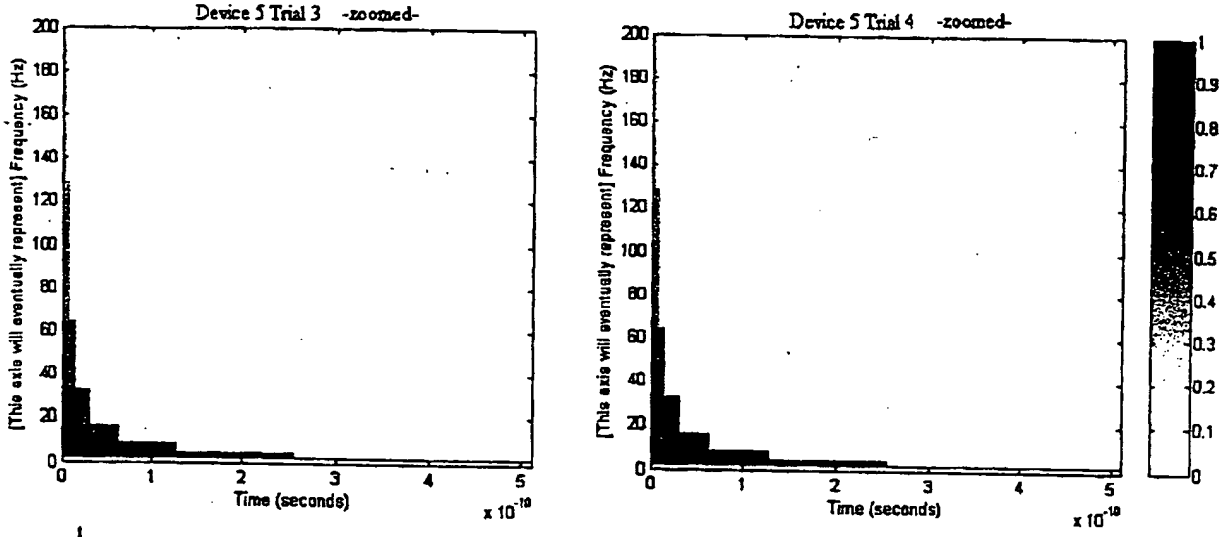
P. O. Box 655474, M/S 3999
Dallas, Texas 75265
(972) 917-5355

Attorney for Applicants
Reg. No. 52,305

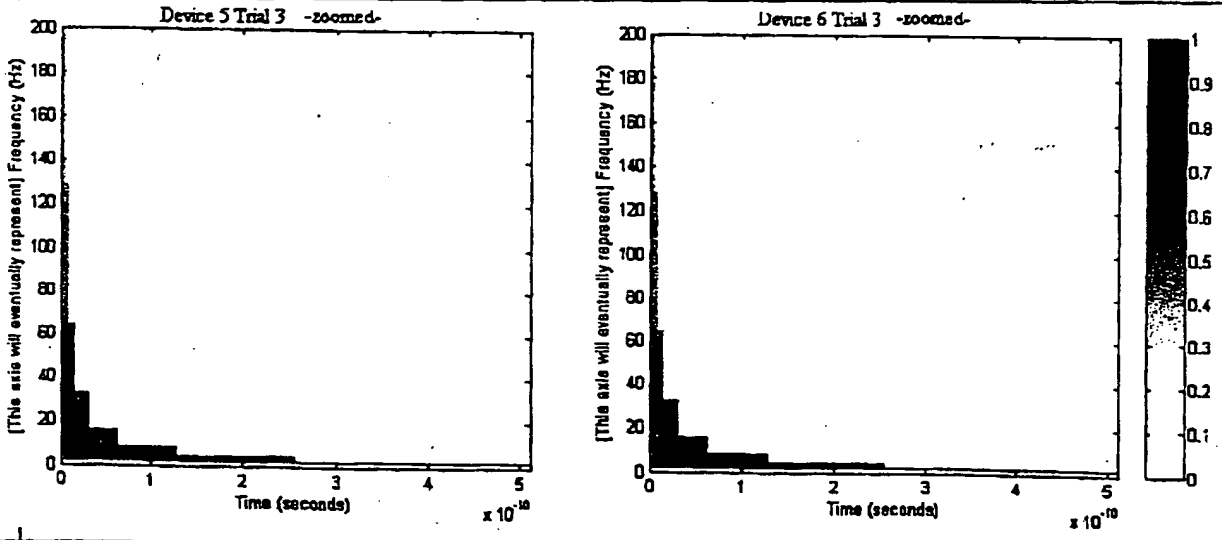
57 PROJECT NAME FDATDRS NOTEBOOK NO. 1

DAUB 4 ANALYSIS

THE WT USING THE DAUBECHIES WAVELET WAS TESTED ON TWO TRIALS OF UNIT 5 (NO DIE OR BUMPS). THE RESULTS WERE VISUALLY SIMILAR. THE WT(DAUB) IS APPROPRIATE FOR TDR SIGNALS



THE WT(DAUB4) WAS ALSO USED IN TWO SIMILAR UNITS (5&6) W/ BOTH DIE & BUMPS REMOVED. THE RESULTS WERE VISUALLY SIMILAR. THE WT(DAUB4) IS CONSISTENT



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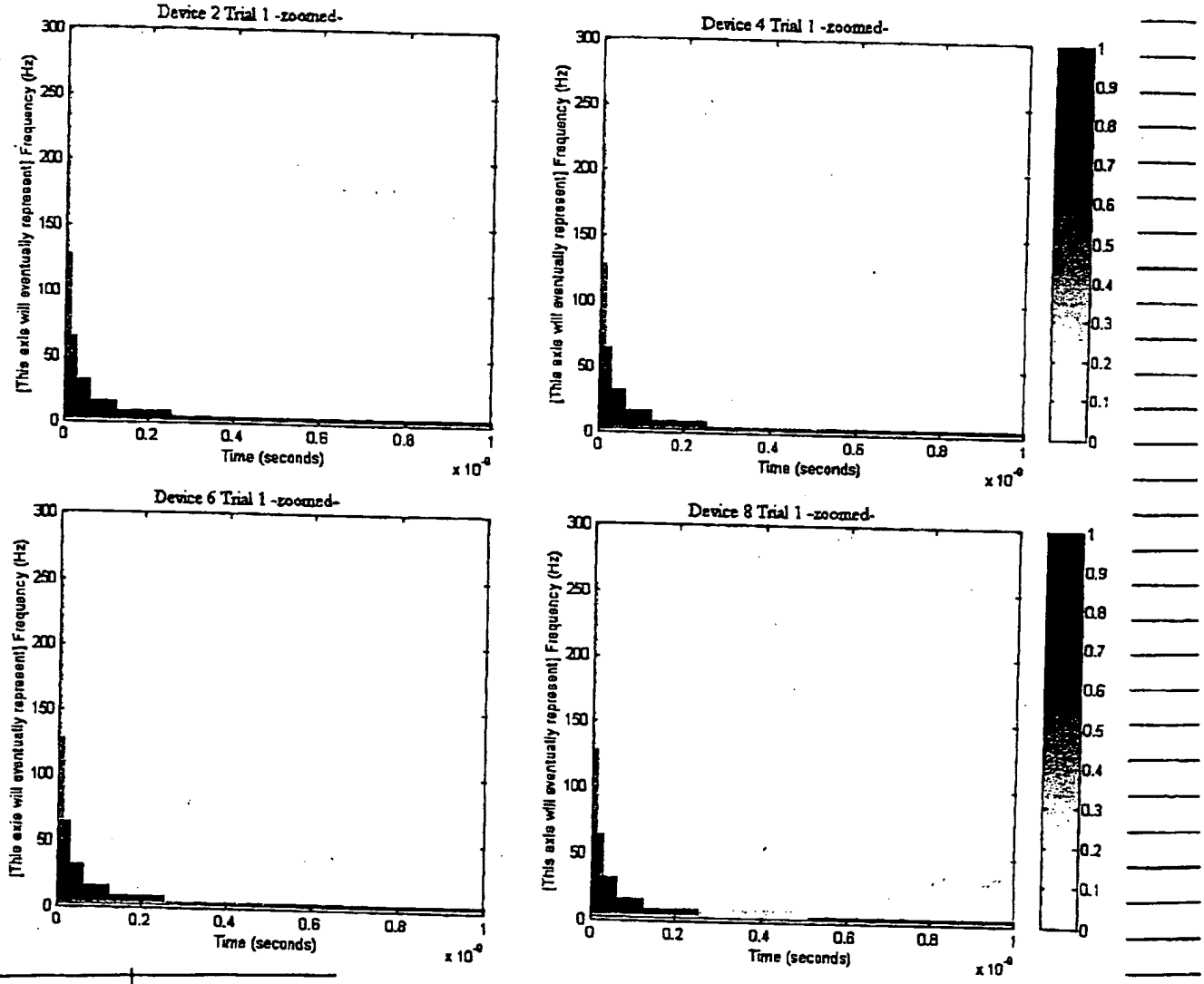
58 PROJECT NAME FDATDBS NOTEBOOK NO. ___

THE WT (DAUB) WAS THEN USED ON UNITS IN THE FOUR PREPARED STATES U2H, U4H, U6H, U8H



WT Using D4 Wavelets for Four Dissimilar Units

THE WT (DAUB) SHOWS PROGRESSION BUT IT IS FAR LESS NOTICABLE THAN IN THE HAAR WT.

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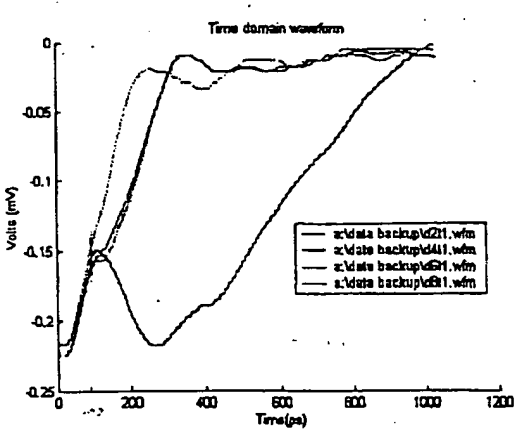
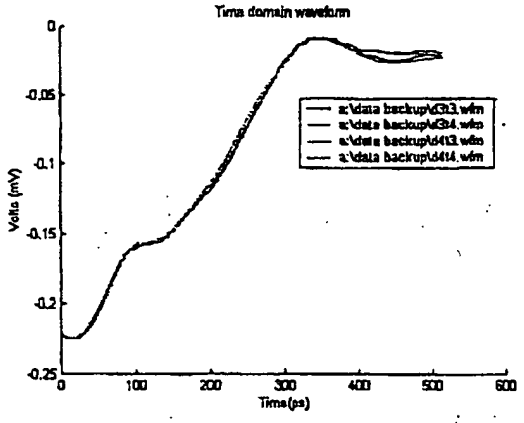
59. PROJECT NAME TDATA'S NOTEBOOK NO. 1

WT (HAAR) ANALYSIS





FROM ~0 - 200 ps, THE TDR WAVEFORMS ARE IDENTICAL. THE ~~VOLTAGE~~ VOLTAGE DIP AT THE BEGINNING OF THE TDR SIGNAL IS THE RESULT PRIMARILY OF THE PROBE TIP CONTACTING THE UNIT.

AFTER THIS POINT, THERE ARE DIFFERENCES BETWEEN THE DEVICES, BUT THEY ~~CAN BE~~ ARE VERY SLIGHT AND DIFFICULT TO INTERPRET, ESPECIALLY FOR UNITS WHOSE CIRCUIT PATHS ARE NEARLY THE SAME LENGTH

POOR A TECHNIQUE THAT COULD EMPHASIZE THE DIFFERENCES WOULD AID COMPARATIVE TDR GREATLY AND COULD HELP BETTER ISOLATE DEFECTS.

SOLUTION WAVELET ANALYSIS, ESPECIALLY USING HAAR WAVELETS, CAN BE USED TO HELP HIGHLIGHT THE DIFFERENCES. ~~RELEASE~~ THE HIGH FREQUENCIES WHICH ARE ASSOCIATED WITH THE ~~MORE~~ CHANGES OF THE WAVEFORM CAN BE COMPARED BETWEEN UNITS TO DETERMINE IF THEY EXHIBIT SIMILAR CHANGES.

THE HAAR WT IS ALSO VERY USEFUL AT IDENTIFYING THE RESISTIVE (FLAT TDR SIGNAL) AREAS IN THE SIGNAL. THOSE AREAS EXHIBIT ONLY LOW FREQUENCIES AND CAN BE EASILY IDENTIFIED USING THE ~~HAAR~~ WAVELET AS A BASIS

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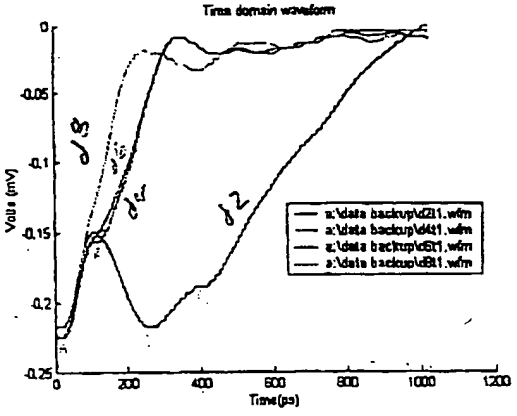
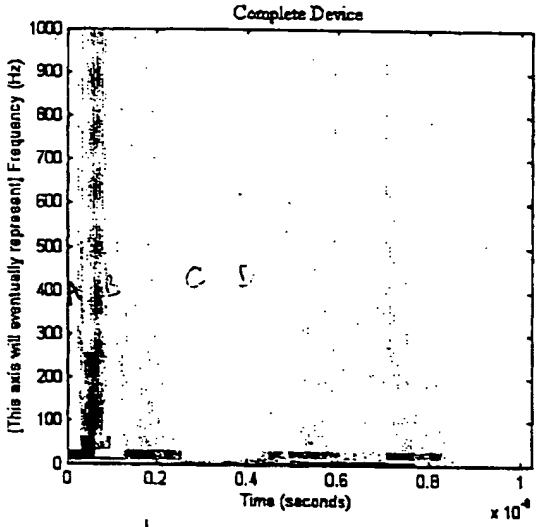
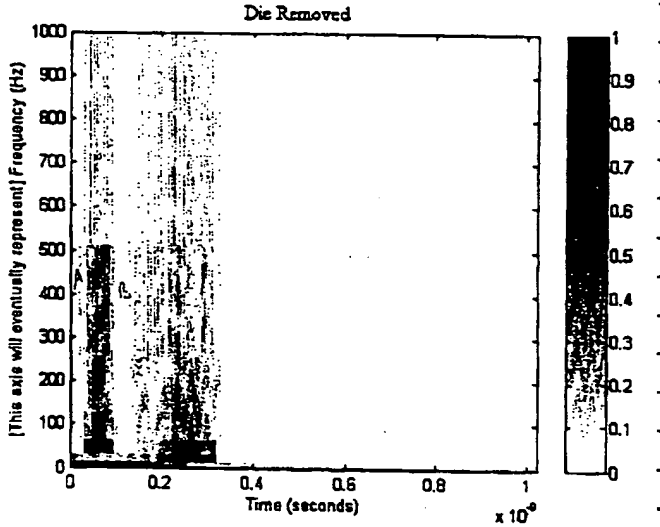
BEST AVAILABLE

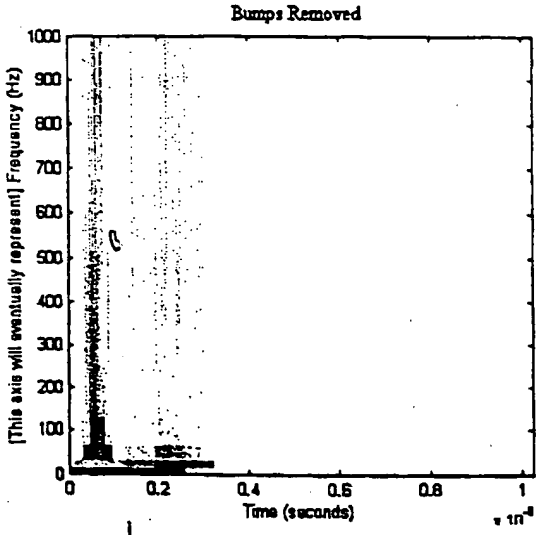
60 PROJECT NAME EDATORS NOTEBOOK NO. 1

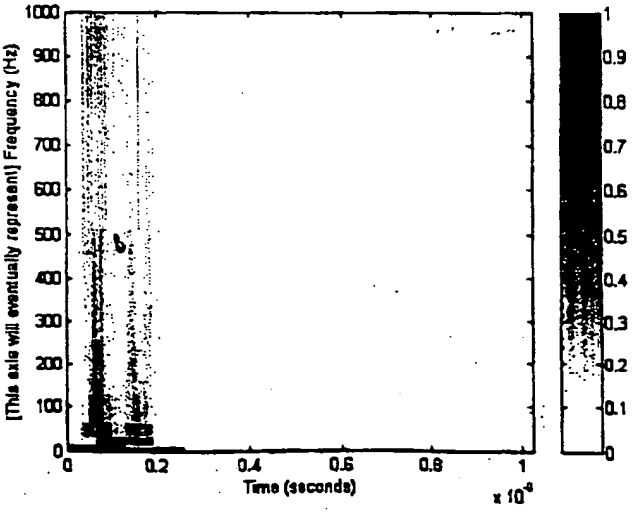


SOME REGIONS OF INTEREST IN THE TIME DOMAIN WFMS ARE LABELED. I FOCUSED MY EFFORTS ON REGION A, THE AREA WHERE THE WFMS BEGAN TO EXHIBIT THEIR DIFFERENCES. WE CAN SEE EASILY WITH THE HAAR WAVELET THAT MORE & MORE HIGH FREQUENCY COMPONENTS ARE INTRODUCED AS THE ELECTRICAL PATH SHORTENS









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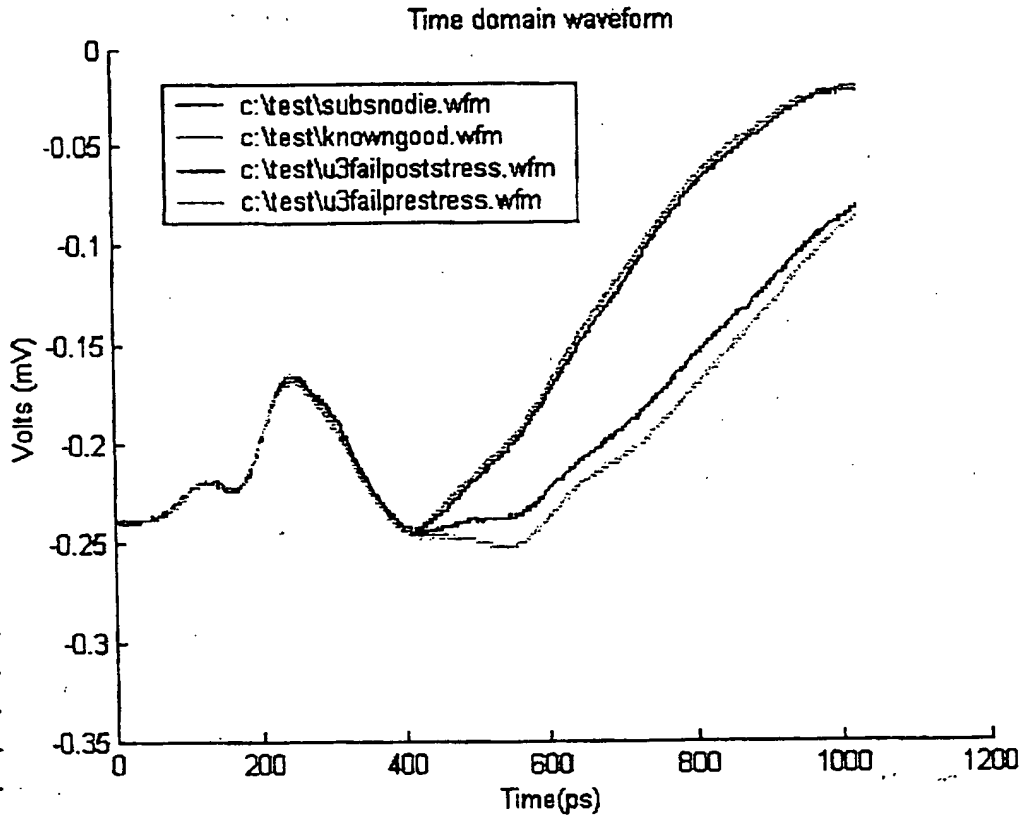
PROJECT NAME FDATDES NOTEBOOK NO. 1

THE WT (HAAR) WAS USED ON A SERIES OF TDR WAVEFORMS AQUIRED BY OMAR DIAZ DE LEON FOR COMPARATIVE TDR. THE DEVICE ORIGINALLY SHOWED TO HAVE A FAILURE AT THE BUMP-TO-DIE INTERFACE.

AFTER STRESSING THE UNIT ELECTRICALLY THE UNIT RECOVERED & ITS NEW SIGNATURE RESEMBLED THAT OF A GOOD UNIT



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